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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,833	09/12/2003	Shean-Jen Chen	03196-UPS	7733
33804 7590 11/20/2007 LIN & ASSOCIATES INTELLECTUAL PROPERTY, INC. P.O. BOX 2339 SARATOGA, CA 95070-0339			EXAMINER VALENTIN, JUAN D	
			ART UNIT 2877	PAPER NUMBER
			NOTIFICATION DATE 11/20/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jason.lin@linassociatesip.com
jasonzlin@gmail.com

Office Action Summary

Application No.

10/660,833

Applicant(s)

CHEN ET AL.

Examiner

Juan D. Valentin II

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 6-10, 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Florin et al. (USPN '667, hereinafter Florin) in view of Lin et al. (USPN '520 B1, hereinafter Lin) and further in view of Bergman et al. ("Spaser: Quantum Generation of Coherent Surface Plasmons in Nanosystems", hereinafter Bergman).

Claims 1, 9-10

Florin in conjunction with Fig. 1 discloses a surface plasmon resonance sensor comprising a prism 3 having a surface on which a metallic layer is coated 10, a first dielectric layer having metallic nanoparticles formed on the metallic layer 6, a light source 1 giving off a light to the prism 3, the light being reflected by the surface of the prism to form a reflected light, and a light detector for detecting the reflected light (col. 1, lines 30-46, col. 3, line 48-col. 4, line 4, col. 5, lines 40-53, col. 6, line 64-col. 7, line 19, col. 7, line 52-col. 8, line 10).

Florin discloses the use of a metal/dielectric interface in a surface plasmon resonance (SPR) sensor, however Florin fails to disclose the use of multiple dielectric layers. Lin shows that is known to use a plurality of dielectric layers (col. 3, lines 1-20, col. 4, lines 1-6) within an SPR sensor. It would have been obvious to combine the device of Florin with the multiple dielectric layer sensor of Lin for the purposes of providing depth measurements of different biological molecules under test (col. 9, lines 8-22).

While the thin films of both Florin and Lin are on the nanoparticle level, neither specifically discloses metallic silver nanoparticles in a dielectric layer. Bergman shows that there is an interest and quite extensive research on the use of metallic nanoparticle layers in a dielectric material used in an SPR sensor (claims 1, 9-10, pg. 1-second column, pg. 2-second column, page 3-first column). Given the in depth teaching of Bergman, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Florin with the knowledge that adding metallic nanoparticles to a dielectric layer enable enhanced measurement resolution of nanoscale localized optical frequency fields (pg. 4, second column).

Claims 2 & 12

Florin as applied above discloses a second dielectric layer coated on the first dielectric layer having metallic proerties (col. 6, line 64-col. 7, line 19).

Claims 6-8

Florin as applied above further discloses wherein both metal films consist of gold and silver (col. 6, lines 38-40).

3. Claims 1, 3-7, 9-11, 12-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Florin et al. (USPN '667, hereinafter Florin) in view of Lin et al. (USPN '520 B1, hereinafter Lin) and further in view of Bergman et al. ("Spaser: Quantum Generation of Coherent Surface Plasmons in Nanosystems", hereinafter Bergman).

Claim 1

Johansen in conjunction with Figs. 1a & 2a discloses a surface plasmon resonance sensor comprising a prism 210 having a surface on which a metallic layer is coated 220, a metallic nanoparticle layer formed on the metallic layer 230, a light source 120 giving off a light to the prism 210, the light being reflected by the surface of the prism to form a reflected light 490, and a light detector 510 for detecting the reflected light 490 (col. 4, lines 32-35, lines 42-47, col. 5, lines 3-6, lines 42-55, col. 6, lines 31-61).

Florin discloses the use of a metal/dielectric interface in a surface plasmon resonance (SPR) sensor, however Florin fails to disclose the use of multiple dielectric layers. Lin shows that is known to use a plurality of dielectric layers (col. 3, lines 1-20, col. 4, lines 1-6) within an SPR sensor. It would have been obvious to combine the device of Florin with the multiple dielectric layer sensor of Lin for the purposes of providing depth measurements of different biological molecules under test (col. 9, lines 8-22).

While the thin films of both Florin and Lin are on the nanoparticle level, neither specifically discloses metallic silver nanoparticles in a dielectric layer. Bergman shows that there is an interest and quite extensive research on the use of metallic nanoparticle layers in a dielectric material used in an SPR sensor (claims 1, 9-10, pg. 1-second column, pg. 2-second column, page 3-first column). Given the in depth teaching of Bergman, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to combine the teachings of Florin with the knowledge that adding metallic nanoparticles to a dielectric layer enable enhanced measurement resolution of nanoscale localized optical frequency fields (pg. 4, second column).

Claims 3, 4

Johansen as applied above further discloses a wherein the light source comprises a semiconductor laser array for radiating multiple laser beams (col. 4, lines 43-48 & col. 6, lines 24-30), a polarizing device and a half-wave plate for adjusting polarized components of the laser beams (col. 5, lines 19-21 & col. 6, lines 32-46). Johansen does not explicitly state the use of a $\frac{1}{2}$ wave plate, Official Notice Taken. Johansen discloses the use of "polarizing equipment" (col. 6, line 36), it is the position of the Office that is it well known and well within the knowledge of someone of ordinary skill in the art at the time of the claimed invention to use a $\frac{1}{2}$ wave plate, $\frac{1}{4}$ wave plate or equivalent in an SPR system to help adjust/control the state of polarization of incident illumination light upon a sample under test.

Johansen discloses the use of a Wollaston prisms which is spectral prism as claimed in claim 4 (col. 6, lines 35-36).

Claims 5, 6

Johansen as applied above further discloses wherein the metallic layer is comprised of gold or silver (col. 4, lines 32-36).

Claim 7

Johansen as applied above further discloses wherein the metallic layer is approximately 50 nm thick (col. 5, line 52).

Claim 11

Claim 11 is a product-by-process claim. The patentability of product-by-process claims is not limited to the manipulations of the recited steps, only the structure implied by the steps. All of the claimed structural limitations have been disclosed as shown above in view of Johansen. The method steps claimed would not result in a structurally different apparatus that was made by a different process such as an evaporation process.

Claims 13, 14

Johansen as applied above further discloses comprising a self-assembled monolayer adjacent the metallic nanoparticle layer comprised of one of the functional groups SH, NH₂, CHO, COOH, and Biotin (col. 6, lines 50-63).

Claims 15-17

The method is taught by the functions set forth with regards to the apparatus claims 1, 3, 4, 13, & 14 as rejected above in view of Johansen.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan D. Valentin II whose telephone number is (571) 272-2433. The examiner can normally be reached on Mon.-Fri..

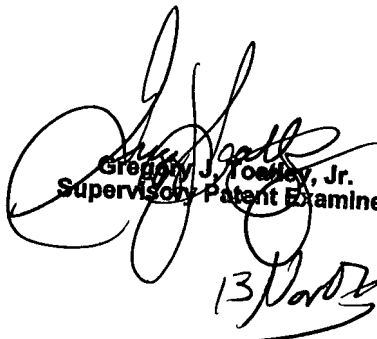
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JDVII/
Juan D Valentin II
Examiner 2877
JDV
November 13, 2007


Gregory J. Tooley, Jr.
Supervisory Patent Examiner
13/Nov/07